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# OCEANOGRAPHIC DATA AT THE S. M. B. L., 1970

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## OCEANOGRAPHIC DATA AT THE S.M.B.L., 1970

Measurements and records of the surface sea water temperature were made every day at 9:00 in the morning at the fixed site on the south coast of the laboratory ground near the sea water intake of the laboratory by

Mr. Hidetomo TANASE,  
Mr. Yoshirô KASHIYAMA,  
Mr. Sôichi MORIYAMA,  
Mr. Mitsuru OHTA, and  
Mr. Yoshikazu YAMAMOTO.

The salinity or chlorinity was measured by titration or salinometer (July through September only) and recorded by the same members on the water sample collected every day at the same time and at the same place.

Meteorological observations and records were made similarly in the laboratory yard by

Mr. Shôji FURUYA and  
Miss Junko KONDÔ.

The calculation of salinity from chlorinity and every necessary correction after formal manuals of oceanographical and meteorological observations, as well as the typewriting of tables, were made by

Dr. Shinichirô FUSE.

For computation of monthly averages of temperature and salinity FUSE and KONDO are responsible.

Weather is shown in Beaufort notation, and wind force in Beaufort scale.

The codes used are:

b	Blue sky	0	Calm	less than 0.3 m/sec
bc	Partly clouded	1	Light air	0.3~1.5 m/sec
c	Cloudy	2	Light breeze	1.6~3.3 m/sec
o	Overcast	3	Gentle breeze	3.4~5.4 m/sec
d	Drizzling rain	4	Moderate breeze	5.5~7.9 m/sec
r	Rain	5	Fresh breeze	8.0~10.7 m/sec
s	Snow			
p	Passing showers			
q	Squalls			

JANUARY							FEBRUARY						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	c	9.3	—	— 0	17.20	34.74	1	c	7.6	—	NW 2	12.10	34.33
2	o	9.1	—	— 0	16.80	34.72	2	c	8.4	—	NW 2	13.50	34.76
3	c	8.4	—	N 1	16.60	34.74	3	b	6.3	—	NW 1	13.40	34.83
4	b	10.0	—	NW 2	16.60	34.76	4	c	8.4	—	— 0	14.20	34.90
5	s	2.2	0.0	NW 3	14.20	34.78	5	bc	3.7	—	NW 2	14.30	35.16
6	c	5.2	—	NW 2	14.00	34.81	6	bc	5.9	—	— 0	14.40	35.12
7	o	8.8	—	NW 2	14.80	34.72	7	c	5.1	—	— 0	15.00	34.99
8	b	7.3	—	NW 2	15.50	34.74	8	r	14.6	4.6	W 2	15.50	34.49
9	c	8.0	—	NW 2	15.80	34.74	9	o	6.2	0.8	W 3	14.50	34.96
10	c	6.4	—	— 0	15.10	34.69	10	sp	2.5	0.0	NW 3	11.90	34.98
11	b	9.3	—	NW 1	15.30	34.78	11	bc	4.7	—	NW 1	12.90	34.33
12	c	7.2	—	NW 1	14.70	34.79	12	b	6.8	—	— 0	14.20	35.08
13	b	11.7	—	NW 3	16.00	34.76	13	bc	9.3	—	NW	14.00	34.83
14	bc	3.9	—	NW 2	13.50	34.96	14	b	12.9	—	NW	15.80	34.96
15	o	4.7	—	NW 1	13.40	34.87	15	o	9.9	—	— 0	15.60	34.78
16	s	2.7	—	NW 3	13.50	34.79	16	b	7.0	—	W 1	14.70	35.08
17	s	1.6	0.0	NW 3	11.50	34.81	17	b	8.9	—	— 0	14.80	35.79
18	s	2.9	0.0	NW 2	13.00	34.74	18	b	10.2	—	E 1	15.40	35.96
19	c	3.0	—	NW 1	11.50	34.47	19	bc	12.3	—	— 0	16.30	35.92
20	b	4.3	—	— 0	13.70	34.79	20	b	14.0	—	— 0	16.40	35.94
21	b	7.1	—	NW 1	14.30	34.85	21	o	8.2	18.5	NW 2	15.70	35.76
22	bc	7.6	—	NW 2	13.80	34.79	22	o	7.4	—	NW 2	14.60	35.92
23	o	8.1	—	NW 1	14.30	34.79	23	o	9.3	—	NW 1	15.30	35.05
24	bc	6.8	—	NW 1	14.00	34.87	24	o	8.4	1.1	— 0	15.70	34.98
25	b	7.8	—	— 0	13.80	34.94	25	r	13.1	3.0	SW 2	16.10	34.81
26	b	5.4	—	— 0	13.80	34.79	26	d	12.4	1.5	— 0	16.40	34.99
27	b	6.3	—	— 0	13.20	34.74	27	b	11.9	0.5	NW 2	16.30	35.03
28	b	6.7	—	— 0	16.00	34.94	28	rp	8.0	1.5	— 0	16.00	35.03
29	b	8.0	—	— 0	17.10	34.94							
30	r	11.4	21.5	— 0	15.90	34.05							
31	o	7.3	79.5	NW 3	15.20	34.42							
average		6.7			14.65	34.75	average		8.8			14.82	35.10

MARCH							APRIL						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	c	5.0	0.1	SW 1	15.50	35.05	1	c	12.1	—	— 0	16.00	34.94
2	o	4.3	—	NW 1	13.70	35.08	2	c	13.6	—	— 0	16.40	34.63
3	o	7.0	—	— 0	13.80	35.01	3	o	12.3	3.5	NE 1	16.30	34.33
4	r	6.9	11.1	NE 2	14.20	34.78	4	r	10.0	13.3	— 0	15.80	34.43
5	c	5.0	0.5	NW 3	13.60	34.94	5	b	11.8	28.5	NW 2	15.70	32.85
6	b	6.5	—	NW 3	13.40	34.92	6	b	14.2	—	— 0	16.50	33.69
7	c	9.0	—	N 3	12.60	34.96	7	r	16.5	1.2	S 1	17.00	34.34
8	c	9.6	—	N 1	13.40	35.01	8	b	14.6	3.8	— 0	17.80	34.51
9	b	10.5	—	— 0	15.20	34.90	9	o	16.2	—	— 0	17.10	34.67
10	o	13.1	—	— 0	15.70	34.90	10	o	16.8	0.3	— 0	17.70	34.49
11	bc	8.8	9.7	N 1	15.00	34.89	11	r	15.6	27.1	N 1	17.70	34.31
12	b	7.1	—	N 1	14.30	34.72	12	c	14.1	16.3	NW 1	17.80	33.75
13	o	6.3	—	N 1	13.50	34.94	13	o	11.1	—	N 1	16.70	34.79
14	bc	7.8	7.0	N 1	14.30	34.90	14	o	9.5	—	— 0	15.40	34.27
15	o	9.2	—	— 0	14.90	34.79	15	b	16.1	—	— 0	17.20	34.70
16	r	4.7	15.1	N 2	16.40	34.81	16	o	18.1	—	— 0	17.50	34.76
17	bc	7.3	2.4	NW 3	14.70	35.14	17	d	17.9	1.9	S 1	18.10	34.98
18	b	7.1	—	NW 1	14.10	35.17	18	o	19.4	24.0	S 1	18.20	33.68
19	bc	5.3	—	NW 2	14.20	35.30	19	o	17.4	—	NE 2	17.70	33.37
20	o	6.0	—	NW 1	13.40	35.05	20	r	17.1	2.5	— 0	17.60	33.96
21	b	6.1	—	N 1	13.40	35.12	21	o	16.8	23.2	NW 2	18.20	34.27
22	o	6.0	2.1	— 0	13.00	35.05	22	o	15.0	—	N 1	17.90	33.98
23	b	12.1	—	— 0	12.40	34.92	23	o	17.6	—	— 0	19.00	34.51
24	o	10.2	—	— 0	13.60	34.89	24	o	17.3	—	E 1	18.90	34.43
25	bc	9.6	—	— 0	14.60	34.94	25	r	16.7	30.0	— 0	17.70	32.63
26	bc	10.1	—	N 1	15.10	35.05	26	o	17.0	39.0	NW 1	18.30	34.05
27	bc	12.8	—	— 0	15.30	34.90	27	b	18.6	0.3	SW 1	19.30	34.60
28	o	15.4	4.3	— 0	16.80	34.85	28	d	16.7	0.1	— 0	19.10	33.66
29	bc	14.5	—	— 0	16.50	34.90	29	b	17.5	18.7	SW 1	17.80	34.20
30	r	13.8	6.8	— 0	16.90	34.69	30	b	17.7	—	SW 1	19.50	33.75
31	b	11.9	14.7	— 0	17.00	34.99							
average		8.8			14.53	34.96	average		15.5			17.53	34.18

MAY							JUNE						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	b	18.6	—	— 0	19.00	34.05	1	o	20.4	12.5	— 0	20.00	34.04
2	o	18.6	—	— 0	18.40	34.29	2	b	23.5	—	NW 1	22.50	34.20
3	o	16.2	0.5	— 0	18.20	34.24	3	o	22.8	—	S 1	22.40	34.16
4	r	17.1	20.0	— 0	17.80	34.31	4	o	22.3	—	— 0	23.00	34.15
5	o	18.6	10.0	— 0	18.40	33.86	5	o	19.4	31.6	— 0	22.20	33.66
6	r	16.7	8.2	— 0	18.30	34.07	6	bc	20.4	—	S 1	23.20	34.02
7	r	16.4	45.0	— 0	17.60	32.97	7	b	21.8	2.1	— 0	23.90	33.95
8	o	18.3	3.6	N 1	18.70	33.82	8	b	22.0	—	— 0	24.00	34.31
9	bc	20.4	—	N 1	18.50	33.37	9	bc	24.2	—	SW 1	23.30	34.34
10	bc	22.3	—	— 0	19.40	33.91	10	r	20.3	3.0	— 0	22.70	34.16
11	r	19.4	10.0	— 0	20.20	33.62	11	r	20.2	42.5	S 1	22.00	30.99
12	bc	21.3	2.6	NW 1	20.80	34.16	12	r	21.3	28.8	— 0	23.10	33.59
13	bc	20.2	—	NW 1	20.30	34.22	13	o	22.7	39.5	— 0	23.80	33.55
14	b	19.8	—	S 1	20.70	33.55	14	o	24.1	0.6	— 0	24.10	34.25
15	b	22.2	—	— 0	21.00	34.24	15	rp	23.5	1.0	SW 2	24.20	33.89
16	c	20.0	—	— 0	20.50	34.04	16	r	20.5	101.5	NE 2	23.60	29.65
17	c	20.8	2.7	S 1	20.40	34.33	17	o	22.0	0.0	NE 1	22.60	33.62
18	b	20.6	—	S 1	20.70	34.29	18	o	23.1	—	N 1	22.90	32.77
19	c	23.8	—	S 1	21.10	34.00	19	o	24.8	39.5	SW 3	23.20	32.66
20	r	17.8	13.6	— 0	20.50	33.89	20	o	22.2	6.3	— 0	23.20	33.15
21	c	18.9	26.0	— 0	20.50	33.80	21	r	20.2	41.5	S 1	22.60	31.76
22	bc	20.3	—	— 0	20.80	33.80	22	r	19.1	21.0	S 1	22.40	33.12
23	c	22.4	—	— 0	21.70	34.22	23	o	20.2	13.6	— 0	22.50	32.50
24	o	22.3	—	— 0	20.90	34.16	24	o	21.8	11.3	— 0	22.80	32.79
25	o	23.1	—	SE 1	21.30	34.16	25	r	20.6	17.0	— 0	22.30	30.75
26	o	22.4	12.0	S 2	21.90	33.71	26	o	21.3	24.8	— 0	22.60	32.79
27	b	23.6	—	S 1	22.40	33.96	27	o	21.5	18.4	— 0	22.80	32.23
28	c	24.3	—	NW 1	22.80	34.22	28	o	22.5	0.5	— 0	22.60	32.14
29	o	23.3	—	E 1	22.10	34.29	29	o	23.4	—	— 0	23.60	33.10
30	b	23.8	—	— 0	23.10	33.96	30	r	20.8	9.3	— 0	23.00	32.81
31	o	24.1	—	S 1	22.00	34.00							
average		20.6			20.32	33.98	average		21.8			22.90	33.10

JULY							AUGUST						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	c	23.6	11.5	— 0	23.80	33.10	1	r	24.8	74.3	— 0	26.60	31.78
2	bc	24.4	—	SW 1	24.40	33.10	2	o	27.4	3.4	— 0	26.90	32.21
4	o	25.3	—	— 0	24.10	33.10	3	b	29.2	—	— 0	27.80	32.61
3	r	25.4	4.1	— 0	24.20	33.13	4	b	48.4	—	SW 1	27.50	32.86
5	r	25.6	9.4	SE 1	24.40	33.13	5	b	28.5	—	— 0	28.50	32.95
6	c	23.8	95.6	SW 1	24.40	32.07	6	b	29.3	—	S 1	28.60	33.03
7	b	26.5	—	SW 1	25.00	33.26	7	c	29.5	—	S 1	28.40	33.22
8	r	23.8	3.6	SE 1	24.60	33.21	8	c	29.1	2.5	S 1	29.40	32.85
9	c	27.8	0.0	SE 1	25.10	33.40	9	o	28.2	0.4	— 0	29.00	32.95
10	o	26.2	0.7	S 1	25.40	33.40	10	b	31.1	—	NE 1	28.80	32.97
11	r	24.8	4.6	— 0	24.60	33.06	11	b	29.2	—	— 0	28.50	32.97
12	o	26.2	2.4	— 0	24.60	33.28	12	b	27.8	—	— 0	28.40	33.01
13	o	26.1	—	S 1	24.80	32.57	13	b	27.6	0.4	— 0	27.60	33.26
14	o	26.3	2.0	SW 2	25.70	32.61	14	r	27.7	1.1	SE 1	27.60	33.50
15	b	28.2	—	S 1	26.40	32.66	15	r	28.3	15.1	S 4	27.50	33.48
16	o	28.0	—	— 0	26.00	33.19	16	o	28.5	—	S 1	28.10	33.17
17	c	28.0	—	SW 1	26.20	33.06	17	b	28.4	—	— 0	28.80	32.86
18	c	28.0	—	SE 1	26.90	32.97	18	r	24.4	43.5	— 0	28.00	31.94
19	bc	27.8	—	— 0	26.90	32.99	19	bc	26.6	57.5	— 0	27.50	31.33
20	b	27.8	—	SW 1	27.60	32.99	20	c	26.8	3.8	— 0	27.60	32.83
21	c	27.9	—	— 0	27.00	33.01	21	r	27.4	37.0	S 1	26.60	32.86
22	b	28.9	—	— 0	27.30	33.26	22	bc	25.3	—	SW 2	27.30	32.27
23	o	27.8	—	— 0	27.70	33.01	23	c	25.8	6.5	— 0	26.40	34.15
24	o	29.3	—	— 0	28.40	32.79	24	b	28.4	—	— 0	27.80	33.03
25	b	28.5	—	— 0	27.60	32.99	25	b	27.3	—	— 0	27.70	32.59
26	b	28.9	—	S 1	28.10	33.01	26	bc	26.9	—	— 0	28.20	32.72
27	b	29.4	—	S 1	28.10	33.01	27	o	30.1	1.0	SW 1	27.70	32.76
28	bc	28.5	—	S 1	27.50	32.85	28	b	29.8	—	N 1	27.70	33.10
29	c	30.5	—	— 0	27.50	33.24	29	bc	28.2	—	NW 1	27.70	33.30
30	rt	25.8	36.0	— 0	27.10	32.36	30	r	27.6	1.2	S 1	27.40	33.24
31	o	26.8	53.6	— 0	27.20	32.09	31	o	26.9	18.8	— 0	27.70	32.77
average		27.0			26.09	32.96	average		27.9			27.85	32.86

SEPTEMBER							OCTOBER						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	bc	28.9	0.2	S 1	27.80	33.22	1	o	20.2	—	N 1	24.00	34.04
2	bc	28.9	4.7	S 1	28.80	33.04	2	o	21.8	—	SW 1	25.00	33.89
3	b	29.4	0.3	— 0	28.80	33.26	3	o	19.7	—	— 0	24.50	33.78
4	o	28.9	—	— 0	28.50	33.31	4	r	20.8	1.1	NE 1	24.00	33.66
5	b	28.4	1.5	NE 1	28.40	33.19	5	r	18.3	10.0	— 0	23.80	33.75
6	bc	28.2	—	N 1	28.00	33.13	6	b	20.4	0.0	N 1	24.30	33.95
7	b	28.3	—	N 1	28.20	33.37	7	b	22.8	—	N 1	24.70	33.85
8	b	28.4	—	— 0	28.50	33.37	8	b	24.2	—	N 1	25.10	33.75
9	bc	28.1	—	S 1	28.20	32.72	9	bc	24.7	—	N 1	25.30	33.78
10	o	28.1	—	— 0	28.20	32.97	10	o	23.8	—	— 0	25.60	33.93
11	o	27.2	0.8	NW 1	28.30	33.15	11	o	23.6	—	— 0	25.40	33.82
12	b	28.8	20.0	W 1	28.50	32.94	12	r	21.8	5.4	— 0	24.90	33.91
13	o	28.9	—	SW 1	28.80	33.10	13	o	24.4	22.4	S 1	25.30	33.39
14	c	28.8	—	— 0	28.30	33.21	14	r	20.7	25.0	— 0	24.50	33.40
15	bc	28.0	—	SW 1	28.90	33.31	15	bc	21.7	2.6	NE 1	24.70	33.91
16	bc	28.3	—	N 1	28.40	32.95	16	o	20.8	—	— 0	24.60	33.62
17	bc	28.3	—	S 1	28.20	33.39	17	r	20.3	36.0	— 0	24.00	33.51
18	rt	24.6	24.8	S 3	27.40	32.45	18	c	18.2	31.6	— 0	24.00	33.66
19	o	24.2	7.3	— 0	27.00	32.39	19	o	20.7	—	NW 1	23.80	33.69
20	c	22.8	7.7	— 0	27.20	32.81	20	b	19.4	—	— 0	23.60	33.75
21	o	25.6	8.9	— 0	26.50	33.42	21	b	19.2	—	— 0	23.40	34.07
22	rp	27.0	—	S 1	28.20	33.59	22	b	18.9	—	N 1	23.00	33.96
23	o	24.6	13.0	— 0	26.90	33.01	23	bc	22.6	—	N 1	23.60	33.94
24	b	25.4	7.3	SW 1	27.00	32.95	24	c	22.6	—	NE 1	23.90	33.91
25	o	25.9	—	— 0	27.00	33.03	25	c	25.4	1.8	E 1	24.50	33.82
26	o	23.4	—	SW 2	26.20	32.99	26	o	21.8	19.8	N 2	24.20	33.57
27	d	20.0	2.3	— 0	25.90	33.31	27	c	15.7	—	NW 2	22.00	33.78
28	r	20.6	1.6	NE 1	25.30	33.31	28	b	16.6	—	N 1	22.40	33.89
29	c	26.1	0.5	— 0	26.00	33.37	29	o	14.8	—	— 0	22.10	34.07
30	c	21.9	3.2	NW 2	25.50	33.53	30	b	15.3	—	NW 2	21.00	34.05
							31	bc	15.4	0.5	N 1	21.10	34.09
average		26.5			27.63	33.13	average		20.5			24.06	33.81

NOVEMBER							DECEMBER						
date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰	date	weather	air temperature °C	precipitation mm	wind	water temperature °C	salinity ‰
1	o	15.2	—	N 1	21.20	33.46	1	c	7.7	—	NE 2	16.10	34.18
2	c	15.1	—	— 0	22.00	34.02	2	o	8.4	—	NE 1	17.40	34.25
3	o	15.6	—	— 0	21.80	34.05	3	c	8.6	3.8	N 3	16.80	34.16
4	c	16.1	—	— 0	21.40	34.15	4	c	9.1	—	NW 3	15.30	33.98
5	c	17.7	—	— 0	21.90	34.18	5	c	11.9	—	NW 2	17.10	34.07
6	c	16.9	—	NW 2	21.50	34.02	6	b	10.6	—	NW 3	16.40	33.89
7	b	16.0	—	NW 3	21.10	33.96	7	b	11.3	—	NW 2	17.00	34.16
8	b	13.4	—	— 0	20.80	33.89	8	bc	9.9	—	NW 4	17.40	34.42
9	b	15.4	—	— 0	21.00	33.84	9	c	7.3	—	NW 1	15.70	34.29
10	o	19.6	—	SW 2	20.80	33.80	10	b	9.4	—	W 1	17.50	34.34
11	b	13.4	26.5	NW 2	19.40	34.36	11	b	10.7	—	NE 1	18.50	34.45
12	b	13.4	—	NE 1	20.20	34.25	12	o	12.8	—	— 0	17.50	34.42
13	bc	18.8	—	W 1	21.20	34.22	13	o	16.4	22.3	NW 2	19.80	34.29
14	r	18.2	17.0	N 1	20.20	33.19	14	c	8.4	—	NW 2	16.90	34.29
15	r	14.8	58.2	N 2	20.10	33.91	15	b	10.4	—	NW 2	17.50	34.33
16	b	11.7	0.3	NW 2	19.80	33.93	16	o	10.4	—	— 0	18.20	34.49
17	b	11.4	—	N 1	19.70	34.00	17	o	13.7	—	— 0	19.00	34.38
18	o	15.4	—	— 0	20.50	34.27	18	b	14.9	—	NW 2	19.50	34.43
19	o	18.1	57.2	NW 1	20.60	33.96	19	bc	9.3	—	NW 1	18.50	34.56
20	o	17.4	66.5	NW 3	21.30	33.22	20	b	7.7	—	— 0	17.60	34.54
21	b	17.1	—	NW 3	20.10	33.30	21	b	12.4	—	N 1	19.00	34.45
22	b	14.0	—	— 0	19.90	33.46	22	o	13.4	—	— 0	18.50	34.51
23	bc	13.6	—	NW 1	19.20	33.22	23	b	11.2	—	N 2	18.60	34.54
24	b	10.5	—	NW 1	19.20	33.42	24	b	10.6	—	— 0	18.50	34.58
25	b	10.4	—	NW 1	19.80	33.80	25	o	9.4	0.4	NW 1	17.90	34.40
26	r	19.4	1.3	S 3	21.30	33.84	26	bc	6.9	—	N 2	16.20	34.42
27	o	17.3	25.0	NW 1	21.70	34.13	27	b	6.4	—	N 2	16.20	34.52
28	b	14.8	1.6	N 1	20.30	34.22	28	c	5.6	—	— 0	16.80	34.54
29	bc	11.4	—	N 3	19.50	34.02	29	c	9.6	—	N 1	17.00	34.51
30	c	5.8	—	N 3	17.30	34.18	30	c	10.3	—	N 1	16.90	34.49
							31	o	9.9	24.0	NW 2	17.00	34.02
average		14.9			20.83	33.88	average		10.1			18.08	34.35